

# Slavomír Hanzely

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## Synopses

- **Researcher** tackling problems on the boundary of Mathematics and Computer Science. Enjoying testing my skills against new challenges
- Proven performance in working independently, collaborating with peers, and leading projects
- Efficiently communicates complex ideas to audiences of all levels and cultures
- Qualities: quick learner, persistent, well-organized, high attention to details

## Expertise

Optimization, Machine Learning, Federated Learning, Mathematics, Algorithms, Programming

## Education

**King Abdullah University of Science and Technology**, Saudi Arabia

*Ph.D., Applied Mathematics and Computational Sciences*

2023 (expected)

*MSc., Applied Mathematics and Computational Sciences*

2020

Topic: Optimization for Machine Learning, group of [P. Richtárik](#)

**Comenius University**, Slovakia

*BSc., Computer Science*

2019

Thesis: Random sampling from uniform distribution on multidimensional polyhedra

## Publications

- Convergence of First-Order Algorithms for Meta-Learning, [arxiv 2023](#)  
Mishchenko, Hanzely, Richtárik
- A Damped Newton Method Achieves Global  $\mathcal{O}(1/k^2)$  Convergence Rate, [NeurIPS 2022](#)  
Hanzely, Kamzolov, Pasechnyuk, Gasnikov, Richtárik, Takáč
- Distributed Newton-Type Methods with Communication Compression, [arxiv 2022](#)  
Islamov, Qian, Hanzely, Safaryan, Richtárik
- ZeroSARAH: Nonconvex Optimization with Zero Full Gradient Computation, [arxiv 2021](#)  
Li, Hanzely and Richtárik
- Lower Bounds & Optimal Algorithms for Personalized Federated Learning, [NeurIPS 2020](#)  
F. Hanzely, S. Hanzely, Horváth and Richtárik
- Adaptive Learning of the Optimal Mini-Batch Size of SGD, [OPT-ML](#), [NeurIPS 2020](#)  
Alfarra, Hanzely, Albasyoni, Ghanem and Richtárik

## Presentations

NeurIPS, IST Austria, KINIT, Flatiron Institute, MBZUAI, Ecole Polytechnique (planned)

## Awards

**King Abdullah University of Science and Technology**

- Dean's Award (3 consecutive years)
- Ph.D. scholarship of USD 75,000/year
- MSc. scholarship of USD 70,000/year

[Vojtech Jarník International Mathematical Competition](#)

2017: 8-10th place (39 universities participated)

[Mathematical Olympiad](#)

2016: 3rd place, Slovak national round

International Mathematical Olympiad participation

2015: bronze medal, Middle European Mathematical Olympiad

## Work Experience

### Flatiron Institute, Simons Foundation

June 2022 – July 2022

*Research associate, group of [R. Gower](#)*

Investigated ML loss reformulations and designed fast variance-reduced algorithms.

### Mohamed bin Zayed University of AI

Feb 2022 – Apr 2022

*Research assistant, group of [M. Takáč](#)*

Developed second-order optimization methods that are fast, practical and provably convergent.

- Resulting in a paper accepted at NeurIPS 2022 ([link](#))

### Wincent (crypto trading company)

Jun 2020 – Aug 2020

*Research intern / software engineer*

Analyzed, modeled, designed practical algorithms to optimize resource allocation of the company; and implemented the developed methods under various constraints.

### Mathematical Olympiad

2017 – 2019

- Marked problems at the national round (3 times)
- Organized national selection camp for the International Mathematical Olympiad
  - created the problem sets for a day and marked the solutions (3 times)
  - restructured format of the camp and created all problem sets (team of 4 people)

## Extracurricular Activities

### Trojsten (nonprofit organization)

2016 – 2019

*Volunteer*

- Prepared competitions and camps (in Math, CS) for talented high school students
  - co-organized 14 competitions (3 as a head organizer)
  - co-organized 20 camps (4 as a head organizer)
  - problem selection: 20 problem sets, ~200 hours of work
  - marked solutions: ~600 solutions, ~150 hours of work
- Lectured: delivered 38 lectures (including a half-day lecture)

### King Abdullah University of Science and Technology

*Teaching Assistant for Federated Learning research*

Assisting students with following aspects of FL research: project choice, literature review, algorithm development, experiment design, result presentation, write-up & submission

## Technical skills

### Research

- Topics: Federated Learning, Higher-Order Algorithms, Stochastic Optimization
- Reviewing: ICML (conference), NeurIPS (conference), TLMR (journal)
- Qualities: patience, persistence, well-organized

### Programming

- Python, PyTorch, Julia, C/C++, Bash
- Flexibility: experience with Matlab, R, Mathematica, SQL, Java, Javascript, Haskell

### Cross-cultural communication

- Co-organized large ultimate frisbee tournament (largest tournament in MENA region & first mixed tournament in Saudi Arabia)
- Studying and working in various international communities
- Organizing a research group seminar
- Organizing a research session at IFORS 2023 conference
- Languages: English, Slovak, French (basics), Russian (passive), Spanish (passive)

## Hobbies

### Sport

- ultimate frisbee - competing in international tournaments
  - Slovak national team: EU Youth Championship 2017, EU Youth Cup 2017
  - KAUST university team: MENA 19, MENA 21, MENA 22, Egyptian Open 22
- in the past: ice-hockey, floorball, karate